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OPPORTUNITIES AND LIMITATIONS OF THERN FOREST TYPES IN INTERIOR ALASKA

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The title and topics of discussion at this symposium are in marked contrast to the situation which currently exists in the northern- and westernmost reaches of the northern forest type. Here we are discussing the possibility of intensive culture. In interior Alaska, serious questions are being raised as to whether or not commercial forestry operations can be considered as a legitimate use of the land. The purpose of this discussion paper is to acquaint you with these forests and some aspects of their potential use and management.

FOREST LAND AND SPECIES COMPOSITION

Alaska's interior forests, which are referred to by the Russian term taiga, cover about 105.8 million acres. Over 22.5 million acres have been inventoried as commercial forest land, that is, land capable of producing at least 20 cubic feet per acre per year of usable wood. The total net sawtimber volume in interior Alaska is estimated to be 31 billion board feet, with 93 percent in trees less than 21 inches d.b.h. The average cubic volume is 1,326 cubic feet, or a little more than 15 cords per acre. Board feet volumes range from 1,500 to 30,000 board feet.

White spruce (Picea glauca), paper birch (Betula papyrifera), and aspen (Populus tremuloides) are the main forest trees found on relatively warm, well-drained sites. Black spruce (Picea mariana) and tamarack (Larix laricina) occur on the poorly drained sites, with or without permafrost. Mixtures of balsam poplar (Populus balsamifera) black cottonwood (P. balsamifera ssp. trichocarpa), and white spruce stands develop on the floodplains of the major rivers.

Only limited study has so far been done in determining growth and yield in Alaska's interior forests. Site index at age 50 years for aspen and birch on the best sites is 65 to 75. Better white spruce sites range from index 80 to 90 at base age 100 years. Research indicates that tree growth can be increased significantly by thinning and fertilization.

The most productive forest lands occur on the floodplains of the major rivers (Yukon, Tanana, Kuskokwim, Susitna) and the south-facing slopes of the Yukon-Tanana upland adjacent to the Tanana River. These sites contain the only site IV land in the region and would be the land most likely to be considered for intensive culture. In addition to the forests on the floodplains, the early successional shrub communities are of potential importance in terms of short-rotation fiber production. Based on limited research, productivity of alder on these sites is in the middle of the range reported for this genus.

FOREST ENVIRONMENT

Climate in the interior is most generally continental. Temperatures range from -70° to 95°F. Precipitation is generally less than 20 inches. Snow accumulation is usually 3 feet or less. Day length ranges from 0 to 4 hours in winter and 20 to 24 hours in summer. The growing season ranges from 90 to 125 frost-free days.

Forest soils are shallow and profiles poorly developed in the taiga; the most common bedrock is micaceous schist. The most important soils in terms of forest development are derived from alluvial and loess parent materials.

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Permafrost, a soil condition which is common in Alaska, is not present on most commercial forest sites. However, permafrost is a dynamic condition depending on plant cover and surface organic layers. Soil temperatures, even in the absence of permafrost, are generally low and are a very important factor in determining forest productivity.

SILVICULTURE

Forest regeneration is one of the most important silvicultural considerations at this time. The forest composition is almost entirely the result of natural regeneration following fire or regeneration on floodplain sites. Experience to date, mostly with white spruce, indicates that optimum regeneration from seed depends on the presence of a mineral soil seedbed. Natural regeneration of white spruce has been adequate under conditions created by small clearcuts and shelterwoods during good seed years. Vegetative reproduction of aspen can form dense stands following wildfire; the adequacy of vegetative reproduction to form fully-stocked stands following harvesting is not known.

One important consideration in forest regeneration is the effect of cool summers on white spruce seed production. Experience from Finland and Sweden indicates that at higher latitudes in these countries cool summers can prevent the maturation of conifer seed crops. Limited Alaskan data indicate that white spruce seed fails to mature in some areas of the state in some years.

LAND OWNERSHIP

Since statehood (1959), a continuing process of land classification and distribution has been occurring. Alaska Natives will acquire 44 million acres of Alaska's total 375 million acres. The State will be selecting over 103 million acres. An additional 80 million acres will be designated as national interest lands for inclusion in new National Forests, Parks, Wildlife Refuges, and Wild and Scenic Rivers. The major area of commercial forested lands will be in State and Native holdings.

FOREST USE

Past and present use has been restricted almost solely to local use: house logs, air-dried lumber, and firewood. This trend is changing as the result of changing land ownership patterns and international wood fiber needs. Interior Alaska's growing stock of 14.25 billion cubic feet could support at least ten pulp mills of 500 tons/day capacity at an average commitment of 14 cubic feet of wood annually from each acre of commercial forest. However, other land uses will prevail in order to maintain a balance of wildland amenities and commodity uses of these forested lands, thereby limiting the total commercial utilization of the timber resource.

One major limitation to forest use is the isolated nature of the commercial forest land and access to this land. Interior Alaska is essentially unroaded. Viable road transportation systems to directly access major timber stands are presently lacking, except for water transportation on major rivers. Recent oil exploration and development activities have resulted in major road segments being constructed north of Fairbanks.

SUMMARY

We believe that opportunities do exist for the management and utilization of interior Alaska's commercial forest land. Volumes and, in some cases, growth potential are similar to those in other parts of the northern forest type where use of forests for wood and fiber production is an established land use. However, lack of practical experience and research data concerning the best management practices means that development of the forest resource must proceed cautiously. Large scale application of essentially untried management techniques should be avoided.

DISCUSSION TOPICS

1. Does Alaska's interior commercial forest land qualify for intensive culture in the light of anticipated world fiber demands and economic constraints?

2. At what point should one consider the application of intensive culture to Alaska's interior commercial forests in light of site classes of IV and V (50-85 and 20-50 cubic feet/acre/gr.)?

3. As markets for timber expand, will demand warrant managing interior Alaska forests for commercial timber production?

4. Will class V sites that characterize interior Alaska forests ever be required to provide commercial timber for future generations, except in extremely localized and subsistence settings?

5. Are there any significant areas of site class IV or site V lands presently under intensive management in areas you are familiar with?

6. Can we eventually, by exercising and applying existing knowledge of intensive cultural practices to all site I to site III lands, not need to depend on the commercial timber resource that is supported on site classes IV and V?

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